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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,424	02/06/2004	John V. Frangioni	14952.0320	2070
27890 7590 10/01/2008 STEP TOE & JOHNSON LLP 1330 CONNECTICUT AVENUE, N.W. WASHINGTON, DC 20036				
EXAMINER				
LUONG, PETER				
ART UNIT		PAPER NUMBER		
3737				
MAIL DATE		DELIVERY MODE		
10/01/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/772,424

Applicant(s)

FRANGIONI ET AL.

Examiner

Peter Luong

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-14, 16-21 and 23-26 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3, 5-14, 16-21 and 23-26 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/10/2008 has been entered.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-3, 5-14, 16-21, and 23 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-24 of U.S. Patent No. 7,181,266. Although the conflicting claims are not identical, they are not

patentably distinct from each other because it would have been obvious to one of ordinary skill in the art at the time the invention was made to been obvious to one skilled in the art to have used the composition set forth pending claims 1-3 and 5-12 in the patented method claims. Pending claims 13-14, 16-21, and 23 involve an obvious broadening of the patented claims.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 6-8, 13-14, and 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Barbera-Guillem (US 6,333,110).

6. Barbera-Guillem discloses the use of semiconductor nanocrystals ("quantum dots"), where an outer layer is bonded to the crystal, in in-vivo imaging of tissue. The quantum dots have a core selected from the group consisting of CdSe, CdS, and CdTe (collectively referred to as "CdX"). CdX quantum dots have been passivated with an inorganic coating ("shell") uniformly deposited thereon (column 2, lines 10-18). Furthermore, Barbera-Guillem discloses that the diameter should have a substantially uniform size in the range of sizes from about 2 nm to about 10 nm (diameter) (column 9, lines 27-31). Barbera-Guillem discloses an emission wavelength of 750 nm. An emission wavelength of 750 nm is well recognized as being in the near -infrared wavelength range. Barbera-Guillem discloses imaging vasculature and monitoring tissue during surgery. With regard to claim 21 Barbera-Guillem discloses that the

excitation light source may comprise a spectrum (visible, or UV, or a combination thereof).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barbera-Guillem (US 6,333,110).

9. With respect to claims 24-25, Barbera-Guillem discloses the use of water-soluble semiconductor nanocrystals ("quantum dots), where an outer layer is bonded to the crystal, in in-vivo imaging of tissue. Barbera-Guillem discloses various peak emissions within its emission wavelength of 400 nm to 750 nm (columns 14-16). Barbera-Guillem fails to disclose the a peak emission at 752 nm or more. However, since Barbera-Guillem teaches emission in the NIR/IR range, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Barbera-Guillem to wavelengths greater than 750 nm as it is well known to one of ordinary skill in the art for NIR/IR range to be greater than 700 nm. The Examiner notes that as the emission range increases the peak emission would inherently increase and a peak emission at 752 nm or more would be a matter of optimization.

10. With respect to claim 26, Barbera-Guillem discloses the use of water-soluble semiconductor nanocrystals ("quantum dots), where an outer layer is bonded to the crystal, in in-vivo imaging of tissue. Barbera-Guillem further discloses an excitation

spectrum in the range from about 190 nm to about 660 nm (column 3, lines 50-52).

Barbera-Guillem fails to disclose the wavelength up to 700 nm. However, it would have been obvious to one of ordinary skill in the art to have modified range of Barbera-Guillem as an optimization of ranges is well within the skill level of one of ordinary skill in the art (MPEP 2144.05).

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barbera-Guillem (US 6,333,110) in view of Bawendi et al. (US 2001/0040232).

12. Barbera-Guillem discloses the use of water-soluble semiconductor nanocrystals ("quantum dots"), where an outer layer is bonded to the crystal, in in-vivo imaging of tissue. Barbera-Guillem fails to disclose the use of a polydentate ligand as the outer layer. Bawendi et al. teaches water-soluble semiconductor crystals with an outer layer comprising a polydentate ligand. Bawendi et al. teaches that multidentate ligands provide enhanced stability to the water-soluble nanocrystals. It would have been obvious to one skilled in the art to have modified Barbera-Guillem such that the outer layer includes a polydentate. Such a modification involves the substitution of one known outer layer in a water-soluble nanocrystal for another. The advantage of such would be that it would provide enhanced stability to the nanocrystal.

13. Claims 5, 9-12, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barbera-Guillem (US 6,333,110) in view of Bryant et al.

14. Barbera-Guillem discloses the use of water-soluble semiconductor nanocrystals ("quantum dots"), where an outer layer is bonded to the crystal, in in-vivo imaging of tissue. Barbera-Guillem fails to disclose a multi-layer semiconductor nanocrystal. Bryant et al. teaches "multilayer nanocrystal heteronanostructures" (Page 73, ¶ 1). It

would have been obvious to one of ordinary skill in the art to have modified Barbera-Guillem in order to provide a multilayer nanocrystal. Such a modification involves the substitution of one known type of nanocrystal arrangement for another. The selection of the materials would have been obvious based upon known suitability for intended use.

Response to Arguments

Applicant's arguments filed 3/10/2008 have been fully considered but they are not persuasive.

Applicant's arguments regarding the obvious double patenting rejection are not persuasive. The fact that a terminal disclaimer was filed in a another application does not affect the requirement of filing a terminal disclaimer in the present application.

With regard to the prior art rejections, the Examiner does not agree with applicant's arguments regarding Barbera-Guillem does not teach near-infrared or infrared wavelength regions. As stated in the previous Office Actions, Barbera-Guillem discloses a range of 400 nm to 750 nm. The Examiner maintains the position that wavelengths above 700 nm are in the infrared range. As evidenced by Waldman et al. (US 5,158,090) "wavelength range from 700 to 1300 nm (in the near infrared (NIR) range)", column 2, lines 67-68, and Parker et al. (US 4,576,173) infrared fluorescence "ranges in wavelength from 0.7 microns to wavelengths in excess of 1.50 microns", column 3, lines 56-59, wavelengths greater than 700 nm are in the NIR/IR range. With respect to Applicant's arguments regarding claims 5 and 23, the Examiner had addressed the arguments by further clarifying the rejection in the Final Office Action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Luong whose telephone number is (571)270-1609. The examiner can normally be reached on Monday - Friday, 9:30 a.m. - 6:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/
Primary Examiner, Art Unit 3737

/P. L./
Examiner, Art Unit 3737